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Personality, Depressive Symptoms, the Interparental Relationship and Parenting: Prospective Associations of an Actor–Partner Interdependency Model

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Grounded on Belsky's process model and family systems theories and using an actor–partner interdependency modeling (APIM) approach (Belsky & Jaffee, 2006; Cox & Paley, 2003), the current study was the first to examine whether Big Five personality characteristics and depressive symptoms of parents and their partners are related to adolescent-perceived parenting behavior directly and indirectly via interparental stress experienced by both parents. Longitudinal data (Time 1: 2001; Time 2: 2007; and Time 3: 2009) from a large community sample of Flemish families was used (N = 455; Time 1 children: M_{age} = 7.10 years). Results revealed that, for both parents, more agreeableness and autonomy predicted more parental warmth, and more depressive symptoms and lower agreeableness predicted more overreactive discipline (i.e., actor effects). Both parents' depressive symptoms predicted their own interparental stress (i.e., actor effects). Regarding partner-effects, paternal overreactive discipline was shaped by mother's extraversion and experienced interparental stress, and paternal warmth was affected by mother's experienced interparental stress in addition to fathers' own psychological resources. In contrast, maternal parenting was affected by their own psychological resources only. Although no consistent mediating role of interparental stress was found, one small dyadic indirect effect indicated that maternal depressive symptoms were related to more paternal overreactive discipline via heightened levels of interparental stress experienced by both parents. These results provide new support for the idea of interdependency between parents and specifically support the fathering vulnerability hypothesis. Tentatively, this study informs clinical practice by showing that family interventions aiming to improve parenting should pay attention to specific personality characteristics affecting parenting behavior and adopt a dyadic approach including both parents, especially when targeting paternal parenting.

Keywords: actor–partner interdependency model, parenting, Big Five, depressive symptoms, interparental relationship

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The last three decades have done much to address the fundamental determinants of parenting question: "Why do parents parent the way they do?" (Belsky, 1984, p. 83). The importance of parents' personal psychological resources (e.g., personality, depression) and contextual resources of support and stress (e.g., the interparental relationship) are underscored in Belsky's process model as well as in classical family systems theory models (Belsky & Jaffee, 2006; Cox & Paley, 2003; Erel & Burman, 1995; Minuchin, 1985). Empirical evidence shows support for associations of parental personality characteristics, depressive symptoms, and the interparental relationship with parenting behavior (e.g., Erel & Burman, 1995; Lovejoy, Graczyk, O'Hare, & Neuman,

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2000; Prinzie, Stams, Deković, Reijntjes, & Belsky, 2009; Wilson & Durbin, 2010). However, Belsky's process model hypothesized a mediational process in which parental individual resources are related to parenting both directly and indirectly, via sources of stress and support such as the interparental relationship. This process has not been empirically investigated including both personality and depressive symptoms as psychological resources and the interparental relationship as a mediator yet (Leinonen, Solantaus, & Punamäki, 2003; Shelton & Harold, 2008). Moreover, following the family systems theories' claim of interdependency between family members, there is the real possibility that parenting behavior is not only predicted by individual parents' characteristics, but those of partners as well (Cox & Paley, 2003; Minuchin, 1985). Unknown is the extent to which parents are interdependent, regarding associations between their psychological resources, interparental stress and parenting.

Addressing these gaps in the literature, the overall aim is to enhance knowledge on predictors of parenting. This prospective study is unique in that it combines personality characteristics and depressive symptoms in predicting parenting (McCabe, 2014) and interparental stress as a mediator in these associations. Furthermore, we will benefit from the actor–partner interdependency modeling (APIM) approach and examine parents' own psychological resources as well as their partner's, and interparental stress experienced by both parents (see Figure 1 for an overview of the model). Importantly, we examine different types of parenting behaviors that are consistently associated with individual differences in children's development: warmth, autonomy—supportive parenting, and overreactive discipline (De Haan, Deković, & Prinzie, 2012; Lekes, Gingras, Philippe, Koestner, & Fang, 2010; Prinzie, De Haan, & Belsky, 2019; Prinzie et al., 2009). Also, adolescent-perceptions of parenting are used consistent with the notion that the impact of parenting on adolescent adjustment is mediated by how adolescents perceive their parents' behavior (Neiderhiser, Pike, Hetherington, & Reiss, 1998).

Primary Determinants of Parenting: Parental Psychological Resources

Two important types of personal psychological resources determining parenting behaviors are personality characteristics and depressive symptoms (i.e., referring to paths c'_{AM} and c'_{AF} in Figure 1; Belsky, 1984; Belsky & Jaffee, 2006). Individual differences in personality are known to shape how people respond to developmental tasks (Caspi, Roberts, & Shiner, 2005). Parenting is an important developmental task, and theoretically, a mature and healthy personality is expected to contribute to the provision of supportive parental care (Belsky, 1984). In the current study, personality characteristics are conceptualized according to the comprehensive and systematic Big Five framework (Hendriks,

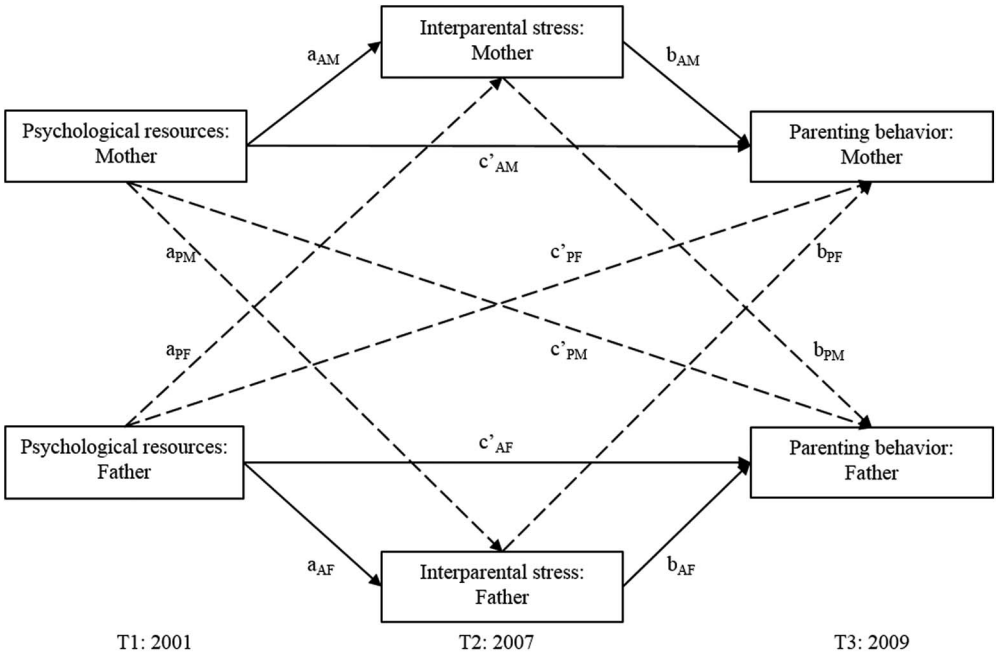

Figure 1. Simplified representation of conceptual and statistical actor–partner interdependency model. Continuous line = actor-effect, dotted line = partner-effect. a = direct path from predictor to mediator variable (personality-marriage association), b = path from mediator to dependent variable (marriage-parenting association), c' = relation between the predictor and dependent variable (personality-marriage association), when the mediator is included. AM = mother-driven actor-effect; PM = mother-driven partner-effect; AF = father-driven actor-effect; PF = father-driven partner-effect. Psychological resources = Big Five and depressive symptoms. Parenting behavior = warmth, autonomy support and overreactive discipline. For reasons of clarity these overarching terms are used, however, each personality characteristic, depressive symptoms and the three parenting behaviors are included separately in the model.

Hofstee, & De Raad, 1999; McCrae & Costa, 1999). The Big Five dimensions are typically labeled as extraversion (i.e., sociability and agency), agreeableness (i.e., empathy, consideration of other's needs), conscientiousness (i.e., control impulses, plan), emotional stability (vs. neuroticism), and autonomy (i.e., intellect, autonomy, imagination). Regarding specific Big Five–parenting associations, a meta-analysis showed that mothers and fathers scoring higher on all five dimensions engage in warmer and more structured parenting, whereas mothers and fathers scoring higher on agreeableness, emotional stability, and openness show more autonomy-supportive parenting (Prinzie et al., 2009; Prinzie et al., 2019). Thus, specific personality dimensions relate to different types of parenting behaviors. Empirical studies examining effects of all Big Five dimensions on parenting simultaneously, showed that some but not all dimensions were uniquely related to parenting when controlling for the others (Bornstein, Hahn, & Haynes, 2011; De Haan et al., 2012). Thus, the effects of the Big Five dimensions on parenting may to some extent be overlapping.

Within developmental psychology, the link between depressive symptoms and parenting behavior has been investigated (Lovejoy et al., 2000). A depressive mood is marked by increased negative affect (i.e., distress, irritability, and anger) and decreased levels of positive affect (i.e., energy, enthusiasm, and engagement). Therefore, higher levels of depressive symptoms in parents are expected to be related to more hostile and negative interactions and less positive interactions with their children (Clark & Watson, 1988; Lovejoy et al., 2000). Meta-analytic work chronicles consistent relations between depressive symptoms and both higher levels of negative parenting (e.g., hostility, overreactive discipline) and lower levels of positive parenting (e.g., engagement, warmth, autonomy-support), for mothers (Lovejoy et al., 2000) and fathers (Wilson & Durbin, 2010).

Although personality dimensions and depressive symptoms are interrelated, and their associations with parenting behaviors are not independent (McCabe, 2014), very few studies have addressed the extent to which parental psychological resources are associated with parenting while accounting for interrelations among personality and depressive symptoms. The fact that depressive symptomology is related to emotional stability as measured in the Big Five (i.e., neuroticism; Kotov, Gamez, Schmidt, & Watson, 2010), raises the general question of overlapping and unique effects of the psychological resources on parenting. Because this study focuses on personality and depressive symptoms, new insights in unique and combined effects of these distinctive ways of operationalizing the construct of psychological resources on parenting can be elucidated.

Mediation by Interparental Stress

The interparental relationship is a central contextual source of stress and support in the family context expected to mediate associations between parents' psychological resources and parenting behavior (Belsky, 1984; Cox & Paley, 2003). Interparental stress is defined as the experienced level of dissatisfaction, lack of support, and amount of disagreements within the relationship (Abidin, 1992) and can be considered an indicator of the multidimensional concept interparental maladjustment (Fincham & Rogge, 2010). Interparental stress can be related to parenting in either of two opposing ways (see Figure 1: paths b_{AM} and b_{AF}; Belsky & Jaffee, 2006; Cox, Paley, & Harter, 2001; Grych, 2002). First, stress in the interparental relationship experienced by a parent may spill over and undermine the quality of parenting and the developing parent–child relationship. The opposing compensation hypothesis asserts that parents compensate for the lack of emotional support in their spousal relationship by seeking a closer and more positive relationship with their child. Although some studies provide empirical support for the compensatory hypothesis (e.g., Cummings, Merrilees, & George, 2010), results from most empirical studies are consistent with the spill-over hypothesis (Buehler, Benson, & Gerard, 2006; Cui & Conger, 2008; Erel & Burman, 1995).

With reference to the associations between psychological resources and the interparental relationship (i.e., paths a_{AM} and a_{AF} in Figure 1), the intrapersonal approach suggests that personality characteristics are potential 'enduring vulnerabilities' for interparental distress (Karney & Bradbury, 1995). These associations have been extensively investigated, with a meta-analysis showing the most robust positive associations between the personality dimensions emotional stability, agreeableness, and conscientiousness and parents' own interparental satisfaction (Heller, Watson, & Ilies, 2004). More recent studies confirm the existence of medium-sized associations for these three personality dimensions, and additionally for extraversion (Dyrenforth, Kashy, Donnellan, & Lucas, 2010) or for all five dimensions with relationship satisfaction (Solomon & Jackson, 2014).

Regarding depressive symptoms, individuals experiencing depressive symptoms will show certain behaviors and enhanced negative affect that could contribute to the occurrence of interparental conflict and stress (Davila, Bradbury, Cohan, & Tochluk, 1997). Research attests to the evidence of (detrimental) prospective effects of depressive symptoms on quality of the interparental relationship, both for men and women (e.g., Davila, Karney, Hall, & Bradbury, 2003; Proulx, Helms, & Buehler, 2007).

Research thus provides empirical grounds for the mediating role of interparental stress, explaining why parental psychological resources are related to parents' parenting. Surprisingly, however, studies evaluating this mediational process are rare. Two notable efforts do provide some preliminary albeit mixed support for this process in early adolescence, for associations between parental depressive symptoms, supportive and hostile interparental interactions and parental styles (i.e., an authoritative, noninvolved or punitive parenting style; Leinonen et al., 2003), and for associations between parental depressive symptoms, interparental conflict and parent–child rejection (Shelton & Harold, 2008). Whereas most studies focus on either personality or on depressive symptoms, the present study examines the mediational role of interparental stress, considering both psychological resources.

Interdependency in Mother–Father Dyads

Research has traditionally focused on how parents' own psychological resources and perceptions of the interparental relationship affect parenting. According to family systems theory, however, individuals within the family system are interdependent (Cox & Paley, 2003; Minuchin, 1985). This interdependency is captured well by Actor–Partner Interdependency Models (APIMs; e.g., Kenny & Ledermann, 2010). In comparison with research designs in which both mothers and fathers are included, but their interde-

pendency is not, APIMs are able to provide additional insight into the extent to which observed associations between psychological resources, interparental stress and parenting are due to a parent's own experiences, and to those of their partner as well (Whisman, Uebelacker, & Weinstock, 2004). The current study will provide new insights in the potential interdependency between parents, by examining direct associations between one parent's psychological resources and that parent's own parenting (i.e., actor effects; paths c'_{AM} and c'_{AF} in Figure 1) and their partner's parenting (i.e., partner-effects; paths c'_{PM} and c'_{PF} in Figure 1), and the mediating role of interparental stress experienced by both parents in these dyadic processes (i.e., Figure 1: combinations of the paths a_{AM}, b_{AM}, a_{AF}, b_{AF}, a_{PM}, b_{PM}, a_{PF}, and b_{PF}).

Two contrary hypotheses about partner-effects of psychological resources and the interparental relationship on parenting behavior are described in the literature. First, fewer psychological resources and more interparental stress of one parent could undermine the quality of the partner's parenting, reflecting a (stress) cross-over process (Cox et al., 2001; Nelson, O'Brien, Blankson, Calkins, & Keane, 2009). Second, the partner of a parent with lower psychological resources and higher experiences of interparental stress may also try to compensate such adversity by showing more seemingly positive and less negative parenting, thereby reflecting a compensatory cross-over process. We state "seemingly" because compensatory parenting could also promote reduced support for an adolescent's autonomy, in attempt to keep the child close and, thereby, protect him or her (Cox et al., 2001).

In contrast to the large amount of studies examining actor effects, to the best of our knowledge no studies have examined partner-effects between personality dimensions and parenting behavior (i.e., paths c'_{PM} and c'_{PF} in Figure 1). With regard to depressive symptoms, two cross-sectional studies showed partner-effects while controlling for actor effects. The first study showed stress cross-over partner-effects, indicating that Flemish mother- and father-adolescent communication was negatively affected by the depressive symptoms of the partner (Ponnet et al., 2013b). The second study reported compensatory cross-over partner-effects in an American sample, indicating that when either mothers or fathers reported depressive symptoms, the spouse reported more supportive responses to 7-year-old children's negative emotions (Nelson et al., 2009).

Partner-effects of the interparental relationship on parenting have also received limited attention (i.e., paths b_{PM} and b_{PF} in Figure 1). One longitudinal APIM-study showed that mothers and fathers whose partner engaged in more destructive conflict behavior in the interparental relationship evinced less sensitivity when observed interacting with their child (i.e., cross-over process; Klausli & Owen, 2011). However, for associations between interparental support and responsive parenting no partner effects were found up and above actor effects (Klausli & Owen, 2011; Nelson et al., 2009; but see Ponnet, Mortelmans, Wouters, Van Leeuwen, Bastaits, & Pasteels, 2013a, for contradictory cross-sectional evidence).

Regarding partner-effects of psychological resources on the interparental relationship, parents can bring certain personality characteristics or a depressed affect into the relationship that have direct effects on the quality or amount of stress in the parental relationship experienced by the partner (see Figure 1: paths a_{PM} and a_{PF}; Malouff, Thorsteinsson, Schutte, Bhullar, & Rooke, 2010; Robins, Caspi, & Moffitt, 2000). A meta-analysis showed that individuals reported higher relationship satisfaction if their partners scored higher on emotional stability, agreeableness, conscientiousness and extraversion (Malouff et al., 2010). Results of two recent cross-sectional APIM-studies showed some evidence for partner-effects of all Big Five traits on relationship satisfaction (e.g., individual's reported higher relationship satisfaction if their partner scores higher on agreeableness; Orth, 2013; Schaffuser, Allemand, & Martin, 2014). For depressive symptoms, one APIM-study indicated that a partner's depressive symptomology was related to lower relationship satisfaction (i.e., partner-effect)—even after taking into account one's own depressive symptoms (i.e., actor-effect; Whisman et al., 2004).

Differences Between Mothers and Fathers

There are reasons to believe that associations between psychological resources, the interparental relationship and parenting may vary for fathers and mothers. Particularly, the fathering-vulnerability hypothesis stipulates that paternal parenting might be more vulnerable to (environmental) stressors than mothering (Cummings et al., 2010). Regarding actor effects, two meta-analyses conclude that depressive symptoms and marital problems are similarly related to maternal and paternal parenting (i.e., actor effects; Erel & Burman, 1995; Wilson & Durbin, 2010). Gender differences regarding partner-effects are less often studied. However, one study shows similar partner-effects between the interparental relationship and a responsive parenting style for mothers and fathers (Ponnet et al., 2013a). In the current study, we explore several patterns in interdependency to determine whether mothers and fathers are similarly or differently affected by actor- and partner-effects.

The Overall Model and Present Study

To summarize, the overall aim of this study was designed to break new ground by examining to what extent personality dimensions and depressive symptoms of parents and their partner are related to adolescent-perceived parenting behavior directly and indirectly via interparental stress experienced by both parents. As the first study to combine personality and depressive symptoms of both parents and interparental stress experienced by both parents in one model, we used a prospective design covering an 8-year period. Therewith, we provide a thorough test of the mediational process proposed in Belsky's process model and of the potential interdependency between mothers and fathers in this mediational process. Specifically, this study can elucidate to what extent personality and depressive symptoms are more important for parenting, to what extent psychological resources of partners are important for parenting, up and above parents' own resources, to what extent the interparental relationship functions as an explanatory mechanism in these dyadic processes, and finally to what extent these processes are similar for mothers and fathers. With those new insights this study can inform clinical practice by helping target family interventions aiming to improving maternal and paternal parenting behavior.

Based on existing literature, we expected (1) actor effects for the Big Five dimensions and depressive symptoms on parental warmth, autonomy and overreactive discipline (see Figure 1: paths c'_{AM} and c'_{AF}); 2) indirect three-step-processes, where associa-

tions between parental psychological resources and parenting behavior are mediated by interparental stress (see Figure 1: paths b_{AM} and b_{AF} and a_{AM} and a_{AF}), and; 3) cross-over *or* compensatory partner-effects of one parent's psychological resources on the other parent's parenting behavior, directly (see Figure 1: paths c'_{PM} and c'_{PF}), and indirectly via the parent's or their partner's experienced interparental stress (see Figure 1: paths b_{PM} and b_{PF}, a_{PM} and a_{PF}).

Method

Participants

This study is part of the ongoing Flemish Study in Parenting, Personality and Development (Prinzie et al., 2003). A proportional stratified sample of elementary-school-age children and their families was randomly selected in 1999. Strata were constructed according to geographical location, children's sex and age. All participants gave written informed consent. The institutional review board of the Katholieke Universiteit Leuven approved all procedures. We used data from the third (2001, Time 1 [T1]), fifth (2007, Time 2 [T2]), and sixth wave (2009, Time 3 [T3]), as these waves contained the measures of interest.

A total of 596 families participated at T1. Families were included when data was available for both spouses and for at least two of the three measurement waves. No further selection criteria were applied based on demographic characteristics. This resulted in a final sample of 455 families (in 24 families, fathers never participated; in 104 families, one or both parents dropped out after T1, and in 13 families, data of one or both parents were available at T2 or T3 only). Mothers in the final sample reported lower levels of interparental stress, $t(467) = -3.16$, $p = .002$, than did mothers within families who did not reach the inclusion criteria. Also, fathers, $t(552) = 2.03$, $p = .043$, and mothers, $t(571) = 3.24$, $p = .001$, in the final sample reported on average a slightly higher level of education.

The final sample of 455 families consisted of parents of 216 boys (47.5%) and 239 girls (52.5%). On average, at T1 children were 7 years and 10 months old (ranging from 6 years to 9 years and 11 months old), mothers were 36.5 years old ($SD = 3.48$), and fathers were 38.4 years old ($SD = 4.02$). At T1, in 407 families (89.5%) parents were together. Percentages of mothers' and fathers' educational level were 0.7% and 3.0% for elementary school, 36.4% and 40.9% for secondary school, 49.3% and 36.7% for nonuniversity higher education, and 13.6% and 19.5% for university. Within this final sample, 451 mothers and 440 fathers participated at T1, 444 mothers and 431 fathers participated at T2, and 412 adolescents participated at T3. Missing data in the final sample mounted 4.56%, with 19.56% of the cases having incomplete data. Missing data points were completely at random (Little's missing completely at random test; $\chi^2[223] = 223.49$, $p = .48$).

Measures

Personality characteristics. Parents rated their personality characteristics using the Five-Factor Personality Inventory (FFPI; Hendriks, Hofstee, & De Raad, 2002) at T1. The FFPI consists of 100 brief items assessing individual differences in behavior, which are rated on a five-point scale (1 = *not at all applicable* to 5 = *entirely applicable*). The FFPI scale and factor scores have high internal consistencies, substantial stabilities, and good construct validity in the normal population (Hendriks et al., 2002). Uncorrelated factor scores were produced, using factor weights, established in a large ($N = 2{,}494$) Dutch normative sample (Hendriks et al., 2002). Example items for each of the personality dimensions and Cronbach's alphas for mothers and fathers, respectively, were as follows in this study: Extraversion—"Loves to chat" ($\alpha = .89, .90$); Agreeableness—"Respects others' feelings" ($\alpha = .89, .88$); Conscientiousness—"Does things according to a plan" ($\alpha = .89, .89$); Emotional Stability—"Can take his/her mind off his/her problems" ($\alpha = .90, .88$); and Autonomy—"Wants to form his/her own opinions" ($\alpha = .85, .87$).

Depressive symptoms. Mothers and fathers reported their depressive symptoms at T1, using the 12-item depression subscale of the Dutch translation of the Parenting Stress Index (PSI; Abidin, 1992; De Brock, Vermulst, Gerris, & Abidin, 1992). An example item is "I often feel like giving up" and answers were given on a six-point Likert scale (1 = *totally disagree* to 6 = *totally agree*). A higher score on this scale represents a higher level of depressive symptoms. The scale was reliable for mothers ($\alpha = .80$) and fathers ($\alpha = .80$).

Interparental stress. Mothers and fathers reported on their own experienced support and stress in the interparental relationship at T2, related to having a child, using the seven-item Marital Relationship subscale of the Dutch translation of the PSI (Abidin, 1992; De Brock et al., 1992). An example item is "Having a child has caused more problems than I expected in my relationship with my spouse" and answers were given on a six-point Likert scale (1 = *totally disagree* to 6 = *totally agree*). A higher score on this scale represented less support and more stress in the interparental relationship. The scale was reliable for mothers ($\alpha = .81$) and fathers ($\alpha = .83$).

Perceived parenting. Adolescent ratings of three types of parenting behavior shown by their mother and father were used (T3). First, adolescents rated their parents' warmth using the scale of the Parenting Practices Questionnaire (Robinson, Mandleco, Olsen, & Hart, 1995), which consists of 11 items that measure the extent to which parents are involved in their child's life and expressed warm parenting (e.g., "Gives comfort and understanding when I am upset"). Answers were given of a five-point Likert scale (1 = *never* to 5 = *always*). The scale was reliable for ratings of mothers' ($\alpha = .89$) and fathers' ($\alpha = .90$) warmth. Second, adolescents reported autonomy-supportive parenting provided by their parents, using the Mother–Father–Peer Inventory (Epstein, Baldwin, & Bishop, 1983), consisting of seven items and assessing the extent to which parents exhibit responsive parenting (e.g., 'Encourages me to make my own decisions'). The scale was reliable for ratings of mothers' ($\alpha = .83$) and fathers' ($\alpha = .85$) autonomy-supportive parenting. Third, adolescents reported on overreactive discipline using the Parenting Scale (Arnold, O'Leary, Wolff, & Acker, 1993). The nine items tapping overreactive discipline measure parents' tendency to respond with anger, impatiently and aversively, to their child's problematic behavior. Items present discipline encounters (e.g., "When I misbehave . . .") followed by two options that act as opposite anchor points for a seven-point scale (e.g., "My mother speaks to me calmly" vs. "My mother raises her voice or yells"). The scale was reliable for reports of maternal ($\alpha = .82$) and paternal ($\alpha = .84$) overreactive discipline.

Analyses

First, means and standard deviations of the study variables and bivariate correlations among the variables were presented. Then, we performed structural equation modeling in Mplus 7.4 (Muthén & Muthén, 1998–2012) to test our proposed APIM (see Figure 1 for a simplified representation of the APIM and the online supplementary material for the full APIM). To maximize our sample, missing values on the model variables were imputed using multiple imputation (Schafer & Graham, 2002). We used the rule of thumb underlined by three simulation studies, that state that the number of imputations should be informed by the percentage of incomplete cases in your data (Bodner, 2008; White, Royston, & Wood, 2011), and created 20 data sets. Next, Mplus was capable of importing these 20 data sets and combining the results in one single step (Acock, 2005).

Following recommendations by Kenny and Ledermann (2010) and Fitzpatrick, Gareau, Lafontaine, and Gaudreau (2016) we tested for specific dyadic patterns in the APIM, enabling us to examine whether mothers and fathers are similarly influenced by actor and partner effects in a systematic manner. In all models, within-wave correlation between the variables at T1 and the residuals at T2 and T3 were included in all models, for mothers and fathers, and between mother- and father-variables. A baseline model including all possible actor, partner, and indirect effects was specified first (i.e., all paths in Figure 1). Next, patterns of interdependency were tested, in terms of nested models, systematically reducing the number of effects estimated. In the first step, four models in which one type of effect was excluded were tested against the baseline model (i.e., in Model A: pathways a_{PF}, b_{PF}-and c'_{PF} are constrained to zero; Model B: a_{AF}, b_{AF}-and c'_{AF} were constrained to zero; Model C: a_{PM}, b_{PM}-and c'_{PM} were constrained to zero; Model D: a_{AM}, b_{AM}-and c'_{AM} were constrained to zero). Next, it was examined whether the best fitting model could be further trimmed in order to find the most parsimonious model (Fitzpatrick et al., 2016; Kenny & Ledermann, 2010). Scripts are accessible as online supplementary material. In the final model, similar paths were constrained across both spouses to examine if these pathways were statistically similar for mothers and fathers.

We evaluated model fit with chi-square, comparative fit index (CFI), Tucker-Lewis index (TLI), standardized root mean square residual (SRMR), and the root mean square error of approximation (RMSEA). We evaluated chi-square and CFI differences to compare nested models (Byrne, 2013). We had adequate power to asses our main question and test differences between the nested structural models ($N = 455$; $\Delta RMSEA = .05$, power = .92; MacCallum, Browne, & Cai, 2006; Preacher & Coffman, 2006).

Results

Descriptive Statistics

Means and standard deviations of the study variables and zero-order associations for mothers and fathers are presented in Table 1. Cross-parent zero-order correlations (not displayed in a Table) showed that higher levels of maternal depressive symptoms ($r = .14$, $p = .003$) and interparental stress ($r = .20$, $p < .001$) were related to more adolescent-perceived paternal overreactive discipline (i.e., all parenting behavior discussed in the result section concern adolescent-perceived parenting and therefore this phrase will not be repeated hereafter) and more paternal depressive symptoms were associated with higher levels of maternal interparental stress ($r = .13$, $p = .009$). Higher maternal conscientiousness ($r = .13$, $p = .011$), autonomy ($r = .16$, $p = .001$), and lower maternal interparental stress ($r = -.16$, $p = .001$) were related to higher paternal warmth. Higher paternal autonomy was related to less maternal overreactive discipline ($r = -.12$, $p = .017$), and higher paternal interparental stress was associated with more maternal overreactive discipline ($r = .16$, $p = .002$) and less maternal autonomy-supportive parenting ($r = -.13$, $p = .009$). Also, more

Table 1
Descriptive Statistics and Bivariate Correlations for Model Variables

	Fathers											
Mothers	1	2	3	4	5	6	7	8	9	10	$M_{fathers}$	$SD_{fathers}$
1. Depression T1	**.33****	–.29***	–.08	–.11*	–.45***	.04	.34***	.14**	–.06	–.07	1.69	.58
2. Extraversion T1	–.20***	**.12***	–.07	.05	.08	–.27***	–.15**	.01	.03	.01	–.01	1.04
3. Agreeableness T1	–.03	–.16**	**.23****	.07	.02	–.03	–.06	–.19***	.06	–.03	.02	.96
4. Conscientiousness T1	–.16**	–.05	.15**	**.29****	.12*	.24***	–.05	–.02	–.03	–.01	.02	.97
5. Emotional Stab. T1	–.47***	.07	–.09	–.04	**.19****	.07	–.18***	–.06	.06	.03	–.04	.96
6. Autonomy T1	–.14**	–.16**	.12*	.10*	.06	**.19****	–.06	–.08	.04	.03	.03	1.04
7. Interp. Stress T2	.44***	–.09	–.03	–.10*	–.24***	–.07	**.48****	.21***	–.17**	–.18***	1.98	.87
8. Overreactive disc. T3	.13**	.02	–.07	–.04	–.10*	–.05	.14**	**.23****	–.39***	–.28***	3.53	1.16
9. Warmth T3	–.09	–.01	.11*	.14**	–.07	.19***	–.05	–.34***	**.50****	.58***	2.84	.80
10. Autonomy support T3	–.01	–.04	.09	.07	–.04	.15**	–.06	–.35***	.54***	**.55****	2.98	.61
$M_{mothers}$	1.82[a]	.02	–.03	.02	–.02	–.01	2.06	3.38[a]	3.44[a]	3.05[a]	—	
$SD_{mothers}$	.64	.99	1.00	.96	.95	.98	.93	1.02	.73	.56		—

Note. Coefficients for fathers are presented above the diagonal, and those for mothers are below the diagonal. Coefficients in boldface type on the diagonal are correlations between mothers and fathers. T1 = Time 1; T2 = Time 2; T3 = Time 3.
[a] Paired sample *t* tests revealed that mothers reported greater depressive symptoms than fathers, $t(438) = 3.80$, $p < .001$, $d = .26$, and adolescents rated their mothers as less overreactive, $t(408) = -2.62$, $p = .009$, $d = .18$, warmer, $t(409) = 15.98$, $p < .001$, $d = 1.12$, and more supportive of their autonomy than fathers, $t(409) = 2.54$, $p = .011$, $d = .18$.
* $p < .05$. ** $p < .01$. *** $p < .001$.

maternal interparental stress was associated with less paternal autonomy-supportive parenting ($r = -.16$, $p = .002$). Last, more maternal depressive symptoms ($r = .21$, $p < .001$) and lower maternal emotional stability ($r = -.11$, $p = .020$) were associated with higher paternal interparental stress.

The Actor–Partner Interdependency Model: Patterns of Interdependency

The baseline model was a saturated model. Next, model fit statistics showed that only the fit of Model A, which includes mother-driven actor and partner effects, and father-driven actor (but not partner) effects, did not fit the data statistically worse than the baseline model, $\Delta\chi^2(27) = 33.24$, $p = .189$, $\Delta_{CFI} = .007$. Subsequently, more restricted patterns of interdependency were tested for Model A. Because all more restricted patterns fit the data significantly worse, the unconstrained Model A was retained. All model fit statistics are provided as online supplementary material. To assess parental gender differences in associations, mother-driven and father-driven actor effects were constrained to be equal. Model fit of this constrained model was not statistically worse, indicating that actor effects are similar for mothers and fathers. This final model fit the data well, $\chi^2(54) = 71.44$, $p = .056$, CFI = 0.982, TLI = 0.958, RMSEA 95% CI = .027 [.000–.042], SRMR = .029.

Parent-Driven Actor Effects

Parameter estimates of the final model for the predictors of maternal and paternal adolescent-perceived parenting are presented in Table 2. Given that all actor effects were similar for mothers and fathers they will be discussed in terms of parental effects. Parental depressive symptoms were significantly related to parents' level of overreactive parenting behavior ($\beta = .10$). Two significant actor effects of parents' personality characteristics on parenting emerged. First, higher parental agreeableness was associated with less overreactive discipline eight years later ($\beta = -.11$). Second, higher parental autonomy was associated with more warmth eight years later ($\beta = .08$). No actor effects of parents' psychological resources on autonomy-supportive parenting were found across 8 years.

In addition, parents' interparental stress did not directly predict their own warmth (i.e., path b_{AM} and b_{AF}; $B = -0.02$, $SE = .04$, $p = .658$, $\beta = -.02$), autonomy-supportive parenting ($B = -0.02$, $SE = .03$ $p = .297$, $\beta = -.04$) or overreactive discipline ($B = 0.09$, $SE = .05$, $p = .103$, $\beta = .07$). Last, although actor effects of depressive symptoms on interparental stress across the 6-year interval were found, no actor effects of parents' own personality characteristics on interparental stress were found (see Table 2).

Mother-Driven Partner Effects

Additionally, partner-effects of maternal psychological resources and interparental stress on paternal parenting were found (see Table 2). Higher maternal extraversion predicted slightly higher levels of adolescent-perceived paternal overreactive discipline ($\beta = .12$). No mother-driven partner-effects of psychological resources on paternal warmth and autonomy-supportive parenting were found. Maternal interparental stress affected paternal warmth (i.e., path b_{PM}; $B = -0.12$, $SE = .05$, $p = .028$, $\beta = -.13$) and overreactive discipline ($B = 0.16$, $SE = .08$, $p = .034$, $\beta = .13$), but not autonomy-supportive parenting ($B = -0.07$, $SE = .04$, $p = .087$, $\beta = -.10$). Further, no mother-driven partner-effects of psychological resources on fathers' interparental stress were found (see Table 2).

Total Indirect Effects: The Mediating Role of Interparental Stress

One total indirect effect of Model A was found to be significant, showing that maternal depressive symptoms were related to more

Table 2
Results of Actor–Partner Interdependency Model for Interparental Stress and Parenting

Predictor	Interparental stress		Warmth		Autonomy support		Overreactive discipline	
	B (*SE*)	β	*B* (*SE*)	β	*B* (*SE*)	β	*B* (*SE*)	β
Mother-driven and father-driven actor effects	paths a_{AM} and a_{AF}		paths c'_{AM} and c'_{AF}		paths c'_{AM} and c'_{AF}		paths c'_{AM} and c'_{AF}	
Depressiveness	.51*** (.06)	.35	−.11 (.06)	−.09	−.03 (.04)	−.04	.17* (.08)	.10
Extraversion	−.03 (.03)	−.03	.02 (.03)	.02	≤.01 (.02)	≤.01	.04 (.04)	.04
Agreeableness	−.02 (.03)	−.03	.06* (.03)	.08	.02 (.02)	.03	−.12** (.04)	−.11
Conscientiousness	−.03 (.03)	−.03	≤.01 (.03)	≤.01	≤.01 (.02)	−.01	.01 (.04)	.01
Emotional stability	−.03 (.03)	−.03	−.04 (.03)	−.05	≤.01 (.03)	−.01	−.03 (.05)	−.02
Autonomy	−.04 (.03)	−.04	.06* (.03)	.08	.03 (.02)	.06	≤.01 (.04)	≤.01
Mother-driven partner effects (Maternal Psychological Resources ≥ Paternal Interparental Stress and Parenting Behavior)	path a_{PM}		path c'_{PM}		path c'_{PM}		path c'_{PM}	
Depressiveness	.07 (.07)	.05	<.01 (.07)	<.01	−.03 (.04)	−.04	.12 (.12)	.07
Extraversion	−.04 (.04)	−.05	−.01 (.04)	−.01	−.01 (.02)	−.01	.14* (.06)	.12*
Agreeableness	−.02 (.04)	−.03	.03 (.04)	.03	.03 (.03)	.05	−.02 (.06)	−.02
Conscientiousness	.01 (.04)	.01	.02 (.04)	.03	<.01 (.03)	<.01	.00 (.06)	≤.01
Emotional stability	<.01 (.05)	<.01	−.04 (.05)	−.04	−.02 (.04)	−.03	.02 (.07)	.03
Autonomy	−.05 (.04)	−.05	.06 (.04)	.07	.02 (.03)	.03	.06 (.06)	.05

* $p < .05$. ** $p < .01$. *** $p < .001$.

paternal overreactive discipline, via more maternal and paternal interparental stress ($B = 0.09$, $SE = .04$, $p = .035$, $\beta = .05$). No other specific or total indirect effects were found.

Discussion

Guided by Belsky's process model (Belsky, 1984; Belsky & Jaffee, 2006) and family systems theories (Cox & Paley, 2003), the current longitudinal study had the overall aim of enhancing knowledge on predictors of parenting. This study was unique in combining personality characteristics and depressive symptoms in our operationalization of psychological resources related to parenting (McCabe, 2014) and investigating interparental stress as a mediator in these associations. Moreover, adopting a APIM approach and examining both parents' own psychological resources as well as their partner's, and interparental stress experienced by both parents in one model, enabled us to examine to what extent parenting is affected only by an individual's characteristics and experienced interparental stress, or by those characteristics and experiences of the partner as well. Due to these innovations, this study could advise family interventions targeting parenting about what parental psychological resources are important for maternal and paternal parenting, whether interparental stress functions as an explanatory mechanism and whether there is interdependency between parents that should be taken into account.

Actor Effects: Direct Parental Psychological Resources–Parenting Associations

Following McCabe's (2014) recommendation to integrate the two lines of research focusing on personality or depressive symptoms in relation to parenting, this study provided a first test of the unique or overlapping contribution of these different determinants for three parenting behaviors. Actor effects were similar for mothers and fathers. First, more agreeable parents were perceived as showing more parental warmth and less overreactive discipline. This indicates that parents who have a larger interpersonal orientation (e.g., more compassion and trust), behave accordingly in their relationship with their adolescents, by reacting more calmly and with greater consideration of the adolescent's needs in disciplinary encounters, than other parents with lower levels of agreeableness. A similar unique role of parental agreeableness is shown previously (De Haan et al., 2012; Prinzie et al., 2019).

Second, more autonomous parents were perceived as showing more parental warmth. Parents who were more flexible in behavior and had more imagination were perceived as more involved and comforting by their adolescents. Adolescence may be more stressful and demanding for parents, due to normative changes in this developmental period (De Haan et al., 2009; Kerr, Stattin, & Burk, 2010; Steinberg & Silk, 2002). More autonomous parents may navigate through this period more easily than other parents, as indicated by more positive parenting (see also De Haan et al., 2012).

A final actor-effect regarding personal resources and parenting behavior was shown for parents' depressive symptoms and their overreactive discipline. Parents who experienced more depressive symptoms were perceived as relatively more overreactive in the disciplinary encounters with their adolescent. This could be explained by the assumption that these parents may have relatively higher levels of negative affect, which is previously shown to be related to negative parent–child interactions because of a spill-over of affect (Clark & Watson, 1988; Lovejoy et al., 2000; Wilson & Durbin, 2010). Overall, specific individual personality characteristics showed to be important for parenting behavior over time, while controlling for interrelations with other personality characteristics and depressive symptoms.

The Mediating Role of Interparental Stress

Regarding the mediating role of interparental stress, one small indirect effect was found showing that more maternal depressive symptoms were indirectly related to more paternal overreactive discipline, via heightened levels of interparental stress experienced by both mothers and fathers. Although this finding is a small effect and should be interpreted with caution, it does provide tentative empirical support for the mediational process hypothesized in Belsky's process model. Moreover, this result supports the principle of interdependency between family members as described in classical family systems theories (Cox & Paley, 2003; Minuchin, 1985). Namely, a spill-over process is indicated in which mother's depressive symptoms spill into the interparental subsystem, which then affects the father–child subsystem. This dyadic process should be replicated as it potentially signals the importance of maternal depressive symptoms in the larger family system.

Addressing the first link in the proposed mediational process (i.e., all a paths in Figure 1), the findings of the current study showed that parents' own depressive symptoms were predictive of their level of experienced interparental stress six years later (i.e., actor effect). This indicates that depressive thoughts, feelings and behaviors contribute to experiences of support and stress in the interparental subsystem, however, only when addressing the depressive parent's own experiences of this relationship. In this study, parents' depressive symptoms did not result in lower relationship stress experienced by the partner across this time period. This finding adds to prior cross-sectional work (Whisman et al., 2004), by showing that links between parents' depressive symptom and subsequent partner experiences of relationship adjustment might not be present across longer periods of time. Finally, in general parents' interparental stress did not appear to be directly linked to parents' own parenting behavior or to function as a consistent mechanism linking parental psychological resources and perceived parenting in this study. In contrast, other studies have indicated associations for interparental distress and conflict with positive and negative parenting behavior (Buehler et al., 2006; Cox et al., 2001; Cui & Conger, 2008). This study, however, suggests that over a period of two years parents' own interparental stress showed no unique association with three parenting behaviors above and beyond effects of one's own personality and depressive symptoms.

Interdependency in Mother–Father Dyads: Mother-Driven Partner Effects

Regarding the interdependency between parents, this study revealed only mother-driven partner effects above and beyond actor effects for both spouses. In general, this is new support for family systems thinking and the fathering vulnerability hypothesis (Cummings et al., 2010), showing that paternal parenting is affected by

maternal psychological resources in addition to fathers' own resources. In addition to the aforementioned dyadic mediation process involving the interparental relationship, three mother-driven effects of personality characteristics were found. Adolescents of more extraverted mothers perceived more paternal overreactive discipline, and adolescents of mothers who experienced more interparental stress perceived less paternal warmth and more paternal overreactive discipline. A tentative interpretation of the first mother-driven effect could be that highly extraverted mothers, who have a high (social) activity level, may be out of the house more often, placing relatively higher demands on the father to take care of the child. Alternatively—or additionally—highly extraverted mothers (i.e., mother high in engagement and relational dominance) may simply make more efforts to shape family dynamics, including their spouses' parenting. Such efforts may lead to decreases in fathers' parental sense of competence or increased frustrations, which may spill over in more overreactive disciplinary tactics in interaction with the adolescent. The second and third mother-driven effects indicate that when mothers experienced greater levels of interparental stress (i.e., less support, more disagreements), fathers were perceived as less warm and more overreactive. This supports the stress cross-over hypothesis, which suggests that interparental stress expressed by mothers, crosses over to fathers, undermining the quality of fathers' parenting. Future research should further examine potential mediational pathways explaining this mother-driven effect. Based on prior literature, father's parental sense of competence may play a role in this process (e.g., Van Eldik, Prinzie, Deković, & De Haan, 2017). Besides explanatory processes at the family level, this association may also be indicative of a certain underlying individual disposition that makes that fathers are perceived as less supportive by both mothers and adolescents.

Limitations and Future Research

This study has some limitations. First, not all constructs were assessed at all (similar) time points, hindering the inclusion of autoregressive pathways (Byrne, 2013). Future research could adopt a developmental approach, as especially changes in one subsystem (e.g., depressive symptoms) could be important for changing another subsystem (i.e., interparental relationship or parenting). In this regard, studying different time-scales (e.g., micro- and meso-level) could illuminate the intervals at which personality-interparental relationship-parenting processes take place (e.g., see Kouros, Papp, Goeke-Morey, & Cummings, 2014). Second, interparental stress is an indicator of the multidimensional concept of relationship maladjustment (Fincham & Rogge, 2010). Future research should investigate to what extent other dimensions of the interparental relationship, such as destructive and constructive conflict behavior, function as explanatory mechanisms. Third, interactions between characteristics of individuals are not part of this study but could potentially help to further explain ways of interdependency between spouses. For example, a hypothesis could be that greater maternal extraversion leads to more paternal overreactive discipline or only for fathers who are low in extraversion. Finally, caution should be exercised with generalizing the findings given that our study consisted of predominantly White families from middle-class background. Studying these processes in more at-risk or culturally different samples could potentially lead to different findings and therefore replication is needed before drawing definite conclusions (Henrich, Heine, & Norenzayan, 2010).

Conclusion

In conclusion, the current study was the first to examine to what extent personality dimensions and depressive symptoms of parents and their partner are related to adolescent-perceived parenting behavior directly and indirectly via interparental stress experienced by both parents. Combining these concepts in one longitudinal actor–partner interdependency model, we provided a thorough test of the mediational process proposed in Belsky's process model (Belsky, 1984; Belsky & Jaffee, 2006) and of potential interdependency between mothers and fathers in this family process (Cox & Paley, 2003). Results revealed that, for both mothers and fathers, lower agreeableness and more depressive symptoms were uniquely related to their individual use of more overreactive discipline, whereas more agreeableness and autonomy were related to adolescent perceived warmth. Although no consistent mediational role of interparental stress was found, maternal depressive symptoms affected paternal overreactive discipline, via high levels of interparental stress experienced by *both* mothers and fathers. Finally, maternal parenting was affected by maternal psychological resources only, and not by those of fathers. In contrast and providing new support for and supporting the idea of interdependency between parents and the fathering vulnerability hypothesis, three mother-driven partner effects were found in addition to the effects of fathers' own psychological resources. Adolescents of more extraverted mothers perceived more paternal overreactive discipline, and adolescents of mothers who experienced more interparental stress perceived less paternal warmth and more paternal overreactive discipline. This study informs clinical practice by showing that family interventions aiming to improve parenting should pay attention to specific personality characteristics affecting parents' behavior and adopt a dyadic approach including both parents, especially when targeting paternal parenting.

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